

REMARKS/ARGUMENTS

The specification has been amended to recite the continuity data.

Claims 1 and 3 are amended to replace the term “derivative” with the term “compound.”

Support for the amendments is found at the originally filed specification and throughout the originally filed claims, and at the originally filed application data sheet.

No new matter is believed to have been added.

As requested at page 2 of the Official Action, the continuity data has been updated.

The indefiniteness rejection of Claims 1 and 3 is believed to be obviated by the amendment of Claims 1 and 3 to replace the term “derivative” with the term “compound.” Withdrawal of the rejection is respectfully requested.

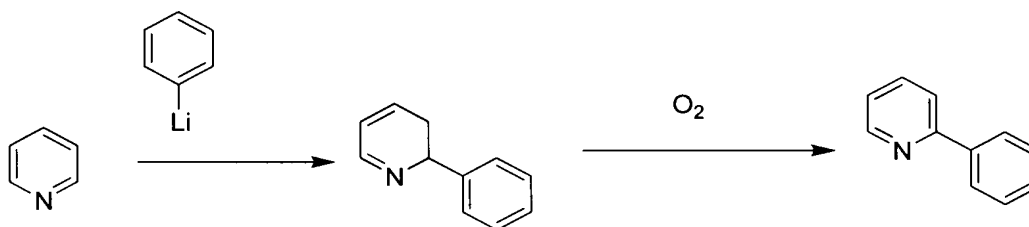
The obviousness rejection of Claims 1-3 as being unpatentable in view of BASF A.G. (“BASF”) in combination with Wakabayashi is respectfully traversed, because the references, either alone or in combination, do not describe or suggest all of the features of present Claims 1 and 3 and the claims depending therefrom.

Applicants have submitted, along with this paper, two references (Journal of the Chemical Society, Chemical Communications, p. 142, (1969) – Reference I; and Tetrahedron Letters, pp. 5291-5294 (1982) – Reference II).

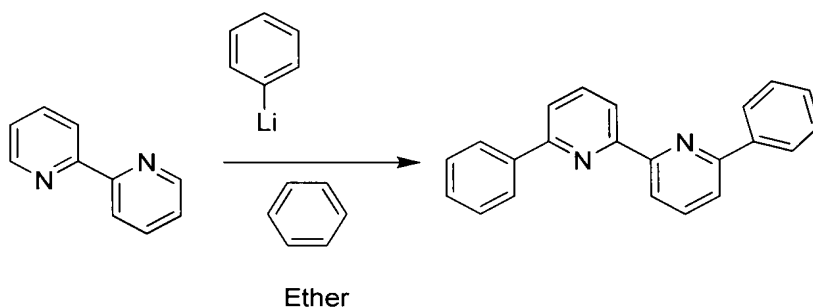
In present Claim 1, for example, the organometallic compound (II') that is reacted with the 2-sulfonylpyridine compound (I) has an aromatic heterocyclic structure (underlining emphasis added). In contrast, in BASF, the organometallic compound has a benzene ring structure (underlining emphasis added).

Thus, BASF cannot render, for example, Claim 1 obvious, because BASF does not describe or suggest all of the features of present Claim 1.

Further, as described in Reference I, phenyl lithium reacts with pyridine in diethyl ether at 0°C to give the 2-phenyl-1,2-dihydropyridine lithium salt, which is then oxidized with oxygen to give 2-phenylpyridine:



In contrast, phenyl lithium does not react with benzene, and benzene is stable in the presence of phenyl lithium (see Reference II). For example, in Table 2 of Reference II, the following reaction example is conducted in the presence of a mixed solvent of benzene/ether:



Thus, an aromatic heterocyclic organometallic compound has a nucleophilic reaction site (e.g., the carbon atom of the carbon metal bond) and an electrophilic reaction site (for example, carbon atom adjacent to the heteroatom) and thus, without being bound by theory, would be expected to autoreact.

Thus, when an organometallic compound having an aromatic heterocyclic nucleus and 2-benzenesulfonyl pyridine co-exist in the same reaction medium, the possibility of a competitive reaction between the aromatic heterocyclic organometallic compound reacting with itself and the aromatic heterocyclic organometallic compound reacting with the 2-benzenesulfonyl pyridine is high.

Further, BASF does not describe or suggest, as described for example, in present Claim 1, that an aromatic organometallic compound II' does not competitively autoreact but rather, reacts with the 2-sulfonylpyridine derivative (I) with high selectivity to efficiently give the 2-substituted pyridine compound (III') because in BASF, no heterocyclic aromatic organometallic compounds are used.

Wakabayashi, does not remedy the deficiency of BASF. Wakabayashi appears to describe a cross-coupling reaction of 2-(methylsulfinyl)quinoline and 2-(methylsulfinyl)pyridine with methylmagnesium bromide to give 2-(2-pyridyl)quinoline. In Wakabayashi, as shown by Scheme 3 and Table 1, a homo-coupling reaction and a cross-coupling reaction proceed competitively. This is very different from the method of, for example, Claim 1, wherein the cross coupling reaction selectively proceeds.

Without being bound by theory, for an organometallic compound having an aromatic heterocyclic nucleus to be present stably, suppressing the autoreactivity of the organometallic compound by a proper state (for example, including using an appropriate temperature) becomes necessary. Only when the proper state and reaction conditions are present can an organometallic compound having an aromatic heterocyclic nucleus be reacted selectively with 2-benzenesulfonylpyridine, as found, for example, in present Claim 1. BASF does not describe the proper state/reaction conditions, and neither does Wakabayashi, because in BASF, no heterocyclic aromatic organometallic compound is present, and in Wakabayashi, among other things, a homo-coupling and a cross coupling reaction occur competitively.

Thus, Wakabayashi and BASF, in combination, do not describe all of the features of present Claim 1, for example, or present Claim 3, and therefore, the combination of the references cannot render the present claims obvious.

Withdrawal of the obviousness rejection is respectfully requested.

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Applicants submit the present application is now in condition for allowance. Early notification to this effect is earnestly solicited.

Respectfully submitted,

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